Does Comparative Advantage Induce Autonomous Liberalization? The Case of Services*

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Abstract

This paper addresses the empirical question whether having comparative advantage leads countries to liberalize trade on a autonomous basis. It uses the case of services to empirically investigate this topic. In most part, services have been liberalized independently from the mulitalital framework, i.e. at the WTO. Various political economy reasons have been developed in the trade literature which may have caused such action. Yet, to date many of these rationales have not been tested. This paper takes a first look at whether economic factors regarding domestic firm interests are a significant driver of this liberalization process. Specifically, it empirically verifies whether comparative advantage in services as a proxy for domestic industry preferences is a strong predictor for countries to liberalize on an autonomous basis. The findings of this paper suggest that this relationship is pretty robust and significant. Generally, relatively well-endowed countries with a high-skilled labour supply undertake unilateral liberalization in those sectors which are high-skilled labour intense. This pattern is also observable for countries well-endowed with ICT-capital. On the other hand, however, the results also show that countries with a strong rule of law are less willing to liberalize in those sectors which are complex and dependant on good contracting institutions. This suggests that reluctance to liberalize services centers around contracts rather than skills.

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1 Introduction

There is a long-standing debate in the trade literature on the issue of liberalization based on unilateralism versus reciprocity. Proponents of unilateral liberalization rely upon the argument that freeing trade autonomously is the most efficient way to reach productivity gains whereas arguments for multilateral free trade focuses on the bargaining chip that countries hold to force other countries to liberalize simultaneously. Since World War II impediments to free trade have been removed largely through reciprocal agreements. In services, however, most liberalization efforts have been based on a unilateral basis: applied trade policy in services is 2.3 times more liberal than committed during the Uruguay Round and has only slightly improved with current Doha offers in services (Gootiiz and Mattoo, 2009).

Successful commitments in services were made as part of the Uruguay Round but have not moved forward ever since. Several factors may play a role for this slow progress. First, less priority was initially given to services on the Doha Round agenda as other topics such as agriculture were of major importance. Second, there is great reluctance by regulators to give up regulatory rights which they have historically used. And third, some countries felt that they had already liberalized sufficiently in previous trade rounds and therefore are reluctant to commit anything further unless other countries will move. In the meantime, however, many countries have moved ahead with liberalizing services on a unilateral basis. In the case of goods various reasons underlie the motivation to dismantle trade barriers unilaterally such as obtaining cheaper inputs from abroad which increases productivity gains or importing know-how for technology upgrading. Countries may also simply may have a favorable climate of opinion toward free trade and hence liberalization. Yet, regarding services it remains unclear as to why countries proceeded with removing barriers indepedently from the reciprocal trade negotiations at the WTO. This paper therefore is the first one to look into the topic of unilateral liberalization in services by investigating whether domestic interests could explain the motivation of countries to free trade independently. Specifically, it addresses empirically the question whether comparative advantage in services as a proxy for domestic services firms' interest has any explanatory power for unilateral services liberalization.

Previous papers analyzing determinants of services liberalization either look into the role of commitments made under the General Agreements of Trade in Services (GATS) or in Preferential Trade Agreements (PTAs). Roy (2011a) finds that both relative economic size as well as a higher level of skilled factor endowments explain country variation in services commitments in the GATS. He also shows that political factors such as democracy and regulatory capacity can help explain this commitment pattern. One of his conclusions is that factor endowments originating from domestic interest groups also have a direct significance on the level of GATS commitments. This results echoes Egger and Lanz (2008) who find that that larger and more capital-abundant countries tend to have a higher coverage of services commitments. In contrast, the authors do not find any of

their political variables to be significant determinants of GATS commitments.[1] Harms *et al.* (2003) investigate the role of domestic political economy forces and international bargaining considerations on GATS commitments in financial services. Other works such as VanGrasstek (2011) and van der Marel and Miroudot (2013) look at liberalization efforts in services RTAs. One important finding in these papers is that although rich countries are inclined to commit multilaterally, this pattern is reversed for commitments in RTAs. None of these papers, however, analyze governments' political economy motivations to liberalize services trade in a unilateral way.

This paper therefore contributes to the above-mentioned literature in the following ways. First, it takes a different approach from the previous works by specifically looking into unilateral liberalization policies. In doing so, it uses a new data set from the World Bank, namely the Services Trade Restrictiveness Index (STRI), which measures the *applied* policy regime of developed as well as developing countries. Second, it develops indicators of comparative advantage as a proxy for domestic interests by using the latest computations from the trade literature. More precisely, I will use recently developed interaction terms of country characteristics and services industry intensities to measure comparative advantage as put forward by Chor (2011) and van der Marel and Shepherd (2013). These interaction terms cover both endowments and institutional based sources of comparative advantage in services. Finally, although services liberalization has been on the agenda since the closing of the Uruguay Round relatively little research has been undertaken in this area. In contrast to previous work around this topic, this paper is the first one to move away from a GATS-framework and focuses on the real liberalization efforts countries have undertaken in recent years.

The rest of the paper is organized as follows. The next section sets out a framework. It introduces some of the political economy sources of unilateral liberalization in services and analyzes specifically their links to comparative advantage. Section 3 specifies the empirical measures of comparative advantage based on the recent trade literature. Section 4 presents the empirical framework and the estimation strategy. Results of the econometrical estimation are presented in Section 5. Finally, the concluding section provides a summary and puts the results into a wider context.

2 Related Literature

The debate between unilateral and reciprocal trade liberalization is a long-standing one. During the so-called first wave of globalization (i.e. 19th century) the prinicple way of liberalizing trade rested upon unilateral actions by countries, notable Great Britain. However, the removal of tariffs, quotas and other trade impediments since World War II has proceeded in a reciprocal fashion which is founded on the idea that a country agrees to reduce import restrictions based on the premise that its trading partners will, in return,

[1] The authors also conclude that countries having already negotiated an RTA in an earlier stage do liberalize more under GATS and are more likely to do so when their 'natural' trading partners are involved.

do the same.[2]

There are economic and political arguments for both types of liberalization. The economic argument for unilateral liberalization lies in the fact that free trade itself is most efficient regardless of whether other countries still hold up their trade barriers. Automomous liberalization allows for access of foreign inputs which in turn can be used by domestic producers and exporters. Moreover, import competition will increase productivity by re-allocating resources domestically to more productive activities. This especially holds true for smaller countries with no influence in the world makret. The economic rationale for reciprocal barrier reductions, in constrast, deals with the so-called "terms-of-trade" argument. When both countries mutually reduce barriers it preserves the external terms of trade as was the case in the previous higher-tariff equilibrium. Once a country successfully induces a partner country to reduce its trade impediments gains for both countries will be greater.

In addition to these efficiency arguments, there are several political economy logics that motivate governments to engage in reciprocal negotiations. First, countries would retain a bargaining chip for access to foreign markets. This is particularly true for bigger countries since their large domestic market are seen as an attractive export place for foreign suppliers. Second, through negotiating mutual concessions a government can mobilize domestic export interests to support domestic reform since exporters profit from access to foreign markets. This can break down the domestic political economy situation where powerful vested interests (i.e. import-competing industries) profit from maintaining higher trade restrictions. Although a situation of unilateral liberalization also gives benefits to exporters, these benefits are only indirect whilst reciprocity gives direct visible gains which creates greater incentives to support reform. Third, shared trade agreements based on reciprocity also gives a credible commitment mechanism to governments for policy change. In this way commitments are made so that rules serve as a basis to "bind" policies.

Traditionally, the liberalization of goods has been based on the principle of reciprocity within the WTO. This principle of mutual negotiation was introduced as well for services during the Uruguay Round in 1994 with the creation of the General Agreements in Trade in Services (GATS). According to the GATS trade in services covers a wider definition due to the nature of services. In the WTO trade in services typically covers four modes of supply. Mode 1 represents cross-border trade. This means that the service is supplied from the territory of one Member into that of another Member. Mode 2 stands for the consumption of a service by consumers of one Member into the territory of antoher (supplying) Member after moving (called consumption abroad). Mode 3 trade are services provided by foreign suppliers that have a commercially establishment in the territory of another Member (i.e. commercial presence). Finally, Mode 4 is a service supplied in the territory of a Member by natural person from abroad who are either employed or self-employed (i.e. presence of natural persons).

[2] A third way of trade liberalization is done through Regional or Preferential Trade Agreeements (PTAs) in which partner countries remove trade barriers in a discriminatory way against third countries. Since this type of freeing trade is outside the scope of the paper it will not be dealt with explicitely.

Although services continue to be negotiated within the current Doha Round, in practise the GATS negotiations have not been working very well. Borchert, Gootiiz and Mattoo (2012) show that there is a big difference between commitments made in the GATS and applied policies set unilaterally. In fact, these applied policies are on average 2.3 times more open than GATS commitments negotiated during the Uruguay Round and even compared to the Doha offers made by WTO members in 2008 this gap would only improve by 10 percent. Effectively this means that countries are not even willing to bind their policies at the multilateral level implying that prevailing barriers can be increased wheneven members want to.[3]

Several reasons are layed out why reciprocity is not working under the GATS (Hoekman and Mattoo, 2013). A first potential explanation is that services themselves require less need for reciprocity-driven negotiations. Services are used as inputs for all other sectors and to the extent these services are inefficient they will generate higher costs for the whole economy rather than for one particular industry as in the case of goods. This leaves less room to negotiate against another sector and could therefore slowdown the multilateral setting. A second potential explanation is that within the services sector market access conditions greatly diverges: Mode 1 is rather open whereas Mode 4 is relatively closed. Export interests seeking greater markets abroad which usually counterweights domestic opposition no longer holds in such situation. Moreover, barriers in services have a unilateral nature in the sense that if a country provides access to a foreign firm it is difficult to deny market access to a third firm from abroad. This is because regulatory barriers, as opposed to tariffs, do not easily allow for discrimination between partner countries. A final argument for the slow process of reciprocity is that there is a lack of effective regulatory standards and implementing bodies which deals with equity concerns in services.

In the meantime countries have liberalized on a unilateral basis. What has induced these countries to make such move? Part of the reasons are related to the less-than-successful reciprocity arguments described above. This paper, however, provides an additional argument from a domestic interest perspective that would motive governments to liberalize autonomously. Governments will be more propeled to liberalize when prospective additional gains are potentially greater than the rents or excess profits stemming from domestic opposition within the same sector. This will be the case when a domestic sector is "strong" enough to encounter competition on the world market. In such situation a country possesses the right endowments for exporting firms on which they can capitalize in order to facilitate the process of reaching potential trade gains.[4] For example, before liberalizing financial services the US owned a strong domestic financial sector due to innovations and was a net capital exporter (White, 2002). Similarly for telecommunications, the abundance of internet in the US was an effective driver to open up this sector so

[3] A part of the services literature also states that although commitments in PTAs are in some areas beyond what has been committed in GATS (see van der Marel and Miroudot, 2013), in essence liberalization in in these agreements are limited (Hoekman and Mattoo, 2012). Adlung and Morrison (2010) have found that many PTAs actually have commitments which are below GATS, i.e. GATS-minus.

[4] An alternative explanation for why trade barriers in services are lowered because of lobbying efforts by domestic firms could be because higher levels of domestic regulation discourages outward investment and trade. In other words, domestic firm find it harder to gain foreign market access if domestic services regulations are high. Evidence for this economic effect can be found in Kox and Nordas (2009) and Sáez *et al.* (2014)

that firms could take advantage of further product development which could be exported (Beltz Soltys, 2002). This shows that when countries enjoy a sufficiently strong (potential) comparative advantage in a sector governments are more inclined to liberalize regardless the actions of partner countries. Comparative advantage in this case tells us something on the extent to which firms are able to take advantage of country endowments. The next section will explain how this is measured in an empirical setting.

3 Empirical Strategy and Data

3.1 Identification Strategy

To measure comparative advantage in the way described above one needs to have information at the country and industry-level. The former are the so-called country endowments whereas the latter represents the characteristics of the service produced. The identification strategy I use is build on interaction terms between these two types of data. This approach relies heavily on Chor (2010) who extends the familiar Ricardian trade model of comparative advantage developed by Eaton and Kortum (2002) to industry-level observations. For trade, the model is therefore ready to explain the observed patterns of specialization at the sector-level across countries. I will use this model of comparative advantage to describe patterns of trade policy. The model relies on a productivity term that contains both a systemic and a stochastic component. The former is driven by interaction effects between country features and industry intensities, in a way reminiscent of prevous work on comparative advantage such as Romalis (2004). The underlying idea is that countries vary in their ability to provide the factor or institutional conditions which are needed for firms to produce a good or service, and industries differ in the intensity with which they use those requirements. Comparative advantage thus stems from the interaction between the two components, one country-specific and one-industry specific.

I regress these interaction terms on the World Bank indicator of applied policy reform for each services sector which countries have undertaken independently from the WTO's multilateral framework. In effect this indicator hence measures unilateral liberalization. Concretely, I estimate the following model with fixed effects:

$$\begin{aligned} \ln(U_o^s) = &\sum_m \theta_m \text{endowments}_o * \text{factor intensity}^s \\ &+ \sum_i \theta_i \text{institutions}_o * \text{institutional intensity}^s + \sum_o \delta_o + \sum_s \gamma^s + \varepsilon_o^s \end{aligned} \tag{1}$$

where U_o^s stands for the unilateral liberalization of country o in sector s in logs; endowments represents a set of variables capturing factor endowments in country o interacted by variables which measure the intensity with which each sector s uses a given factor; institutions relates to a variable capturing the quality of institutions of a country; and institutional intensity refers to the intensity of high-quality institutions each service sector relies on in its production process. The δ and γ terms represent the fixed effects for

country and industry sector respectively. Finally, ε_o^s is a standard error term clustered by country, which satisfies standard assumptions.

The first interaction term in equation (1) reflects the Heckscher-Ohline forces of comparative advantage. A positive and significant coefficient on this term indicates, for example, that countries well-endowed with high-skilled labour are more likely to liberalize in sectors which are relatively more dependent on this type of factor since the production of the service is high-skilled labour intense. Similarly for the institutional interaction term, a positive and statistically significant coefficient means that a country that exhibits strong domestic institutions will find it easier to liberalize autonomously in those sectors of which its production process uses these institutions relatively intensely. On the latter term, recent trade literature has made clear that also institutions affect trade patterns (e.g. Nunn, 2007; Levchenko, 2007). For instance, some sectors are vulnerable to hold-up problems in the supply chain and therefore rely heavily on strong institutions in the form of rule of law. In this case the industry characteristics would measure a sector sensitivity to hold-up problems which is interacted with a country indicator measuring the strength of the rule of law. The next section will describe other interaction terms included and will also outline the sources of data.

3.2 Data

As for the dependent variable I use the World Bank database on services trade barriers to measure the extent to which countries have opened up unilaterally their domestic markets for foreign competition. This database assesses on a scale from 0-100 the applied policy barriers of 103 developed and developing countries for Financial services, Telecommunications, Retail distribution, Transportation and Professional services such as accounting, auditing and legal services for the year 2008/9. Each sector is sub-divided into the three modes of supply of which I chose Mode 1 and Mode 3 since these are economically most meaningful.[5] Because the STRI index measures the level of restrictions, I multiply it by -1 in order to have a measure that increases in levels of liberalization.

For the Heckscher-Ohlin determinants of comparative advantage I specify the interaction term of factor endowments and intensity as follows:

$$\begin{aligned}\sum_m \theta_m \text{endowments}_o * \text{factor intensity}^s \\ = \theta_1 \ln(\text{high} - \text{skilled labour})_o * \ln(\text{high} - \text{skilled intensity})^s \\ + \theta_2 \ln(\text{internet users per 100 people})_o * \ln(\text{ICT capital intensity})^s \\ + \theta_3 \ln(\text{non} - \text{ICT capital stock})_o * \ln(\text{non} - \text{ICT capital intensity})^s\end{aligned}$$

To compute high-skilled labour endowments for each country, I take the log of the average years of schooling of employees in the population aged 25 and over. The data is

[5] Mode 2 and 4 are not selected since the former as not taken into account in the STRI database whereas the latter is still essentially closed and covers trade through temporary migration which follows a different trade pattern of comparative advantage as described above.

taken from the updated Barro and Lee (forthcoming) dataset on educational attainment and proxies a country's high-skilled labour abundance. This variable is interacted with high-skilled intensity for each service sector calculated using data from the EU-KLEMS at 2-digit level averaged over 2003-2004. Specifically, high-skilled intensity is calculated as the ratio of the hours worked by high-skilled labour to the total number of hours worked by all types of skills in a sector. Then, to get a measure of intensity this ratio is multiplied by the total share of high-skilled labour in value added. The second interaction term tries to separate the country-specific ICT-endowments from the conventional factor of production capital. First, I take the amount of internet users per 100 people sourced from the World Development Indicators to capture the relative abundance in ICT. As for a country's non-ICT capital abundance, this measure is calculated using data from the Conference Board which nicely splits the two different types of factors between ICT and non-ICT. I compute non-ICT capital as the share of the non-ICT capital stock per employee in the total capital stock.[6] For both factors of capital the interaction term is again formed by multiplying this variable by factor intensities with data from the EU-KLEMS. Non-ICT capital intensity is first measured as the ratio of non-ICT capital compensation to total capital compensation. This measure is then multiplied by the total share of non-ICT capital in value added. The calculations for ICT-capital intensity follow a similar method where it is measured as the share of total ICT-capital compensation in total value added for each sector. The way all factor intensities are calculated are in line with previous work on comparative advantage and closely follows Romalis (2004).

The second set of variables capturing the institutional forces of comparative advantage are specified by the following interaction terms:

$$\begin{aligned}\sum_i \theta_i \text{institutions}_o * \text{institutional intensity}^s \\ = \theta_1 \text{rule of law}_o * \text{Herfindahl}^s \\ + \theta_2 \ln(\text{high} - \text{skilled labour})_o * \text{complexity}^s \\ + \theta_3 \text{rule of law}_o * \text{complexity}^s\end{aligned}$$

The first country-specific variable measuring institutions is captured by the quality of the legal system and security of property rights in each country. This variable is taken from Gwartney and Lawson (2004) and forms a standard proxy for the strength of domestic institutions in the trade literature. The industry-specific variable Herfindahl measures the extent to which sectors are vulnerable to hold-up problems due to the concentration of input contracts each producer has within an industry. This variable is based on Levchenko (2007) who developed this measure for goods. I calculate this index of product complexity for each services industry using US Input-Output use tables. Specifically, for each 6-digit output industry the Herfindahl index is calculated (multiplied by -1) based on each sectoral

[6] The reason I do not use the same data source for ICT-capital abundance is that the literature (Freund and Weinhold, 2002) suggests that the internet in particular has expanded the scope of services trade and not so much because of other items within ICT-related capital as measured by the Conference Board. The Conference Board measures ICT-related capital broader than only internet usage such as the employment of software and other intangibles.

input use. The index measures input use concentration or, in other words, institutional intensity. A positive coefficient on the interaction term tells us that countries with better legal systems are better placed to export in industries with high-input use concentration which implies that these sectors are sensitive to hold-up problems. All industry data are converted into a 2-digit classification similar to my dependent variable by taking the average over each detailed output industry.

The second and third term are interacted with an industry characteristic, called complexity. This variable represents a measure that assesses the complexity of the services sector using the methodology developed for goods by Costinot (2009). It is computed based on PSID survey data, which ask respondents how long it takes for each employee to be fully educated and qualified for the job in each services sector, hence it measures the magnitude of fixed training costs. This measure can be calculated for all services sectors next to the goods industries originally used in Costinots work. It is equal to the average number of months an employee needs to be fully trained and qualified for working in the service sector under consideration. The 2-digit industry data on complexity are manually averaged and converted into the classification level of the left-hand side variable in equation (1) using self-developed correspondance tables. Then complexity is interacted with two country-specific variables, namely the log of high-skilled labour and the strength of domestic rule of law, as done in Costinot (2009).

Note that no other control variables need to be included which would correct for any political economy factors within a country or sector. This is because I am dealing with a fixed effects model which controls for anything that is country or sector-specific. It's true that results are likely to change when factors such as market size, population or quality of governance are taken into account. Yet, country-fixed effect should take away any important unobserved similarity in data movements. In the same way, the influence of unobserved factors at the sectoral level such as the fact that lobby practises in Professional services could substantially differ from Transportation are taken out by the sector-specific fixed effects.

4 Results

Equation (1) is estimated with OLS of which the results are progressively presented from Table 1 through 6 for each comparative advantage determinant. The results are presented for all modes of services trade together and for Mode 1 and 3 separately. Table 1 shows the outcome for all modes taken together and reports coefficients for the Heckscher-Ohlin forces only. The interaction variables $\ln(H_o)$*$\ln(h^s)$, $\ln(C_o)$*$\ln(c^s)$ and $\ln(I_o)$*$\ln(i^s)$ stand for high-skilled, capital and ICT-related capital sources of comparative advantage respectively. Column 1 and 4 shows that on the whole in services the estimated effect of high-skilled labour is significant and robust. It indicates that countries well-endowed with high-skilled education levels are more inclined to liberalize unilaterally in those sectors that are high-skill intense. Both capital and ICT-related capital show a less consistent

pattern of sign and significance. In column 2 the interaction term on capital comes out negatively significant, but disappears once all factor variabels are taken together. Internet endowments also do not play a strong role in both column 3 and 4.

This outcome changes once we regress our factor variables for each mode individually. Table 2 presents similar regression results for Mode 1 and reveals that the high-skilled labour term has a negative effect on liberalization, as shown in column 4. The interaction term for Internet or ICT-related capital, on the other hand, now has a very robust positive coefficient result in column 3 and as well when taken together with the other Heckscher-Ohlin variables in column 4. It suggests that countries with a higher density of Internet connection are more willing to liberalize in sectors which are using ICT more intensely. This result resonates with the fact that Mode 1 covers cross-border trade which is for most part done over the Internet.

A similar exercise is done for Mode 3 of which the results are shown in Table 3. Here the high-skilled labour term becomes again positive and significant suggesting that countries are more willing to liberalize with respect to foreign affiliates investing in their domestic market when they are active in sectors which are also high-skilled in their production process. The two other interaction terms on capital and Internet are positive in column 4 but remain insignificant. As one can see, surprisingly the two factor sources of comparative advantage of high-skills and ICT-related capital (or Internet) have opposing effects depending on each Mode. It indicates that services liberalization on the whole cannot be taken together. It tells that depending on the characteristic of the sector, each firm is interested in a different type of channel through which trade should be liberalized.

The regressions in the previous tables are repeated in Table 4 though 6, but this time include the three sources of institutional comparative advantages as outlined in the previous section. The interaction terms RULAW_o*herf^s, $\ln(\text{H}_o)$*compl^s and RULAW_o*compl^s covers, respectively, the hold-up problem interacted with rule of law, and the complexity of a services sector, interacted with high-skilled labour and rule of law separately. Table 4 reports the outcomes with all factor and institutional variables for all modes of supply. Again high-skilled labour is a pretty robust factor in explaining autonomous liberalization in high-skilled sectors when including all institutional terms separately and taken together. The institutional term of rule of law with the Herfindahl index reveals a negative coefficient sign which is only weakly significant.

Table 5 shows similar coefficients results for the regressions with regards to Mode 1 only. Again the ICT-related interaction term is significant in all four specifications (Column 1 through 4) indicating a strong relationship even after controlling for institutions. As for the institutional terms, complexity in combination with rule of law reveals a strong negative and significant effect on the extent to which countries are willing to liberalize. This result is interesting and suggests that countries which have strong contracting institutions are less willing to liberalize unilaterally in sectors that much depend on these domestic institutions, in this case because services sectors are complex. Note that the significant negative effect of high-skilled labour in columns 1 and 2 is taken over by the complexity

term in columns 3 and 4.

Finally, Table 6 reports the results for Mode 3. Here as well, the high-skilled labour term shows a strong causal effect on freeing trade unilaterally whereas the other factor variables do not report any significance. Clearly, services trade through Mode 3 seem to include sectors which are relatively more skill intense as opposed to any other capital factor. Looking at the institutional terms only the Herfindahl variable with rule of law has a significant, but strongly negative coefficient result in column 1 and 4 when all variables are entered together. This finding tells us that sectors which need strong enforcement mechanisms to counterbalance the hold-up problem in the supply chain are less likely to be liberalized in countries which actaully can provide these institutions well. Of note, as with the factor variables services sectors also differ in their preferences for liberalization depending on their institutional features. In this sense, the complexity and Hefindahl indicators really measure something different: the issue of complexity is rather sensitive to cross-border trade (Mode 1), whereas the hold-up problem seems to be typically a subject for countries that attract investments through Mode 3.

I also regress the effect of all comparative advantage sources on the probability of having an open or closed domestic market using Probit analysis. In doing so I assess a services market as relatively open once the STRI indicator is below 50 and assign a unity value to the dummy variable. In all other cases a 0 is given. Table 7 reports the coefficient results for all modes (column 1), Mode 1 (column 2), and Mode 3 (coumn 3). The interaction term on ICT-capital is positive but weakly significant for Mode 1 confirming earlier findings using OLS. The results also substantiate earlier coefficient outcomes regarding the institutional determinants: the Herfindahl index for input use in combination with rule of law is negatively significant for Mode 3 whereas the variable complexity with rule of law is negatively significant for Mode 1.

4.1 Discussion of Results

The regressions reveal several interesting outcomes regarding the effect of comparative advantage on unilateral liberalization. The estimation results do indicate that comparative advantage is a strong predictor for applied policy undertaken autonomously by countries. Yet, not all comparative advantage determinants show an equally robust effect on the level of market access provided to foreign firms. As stated before, sectoral features of the production process seem to influence in which type of countries services are liberalized and beyond all through which type of mode. Although countries well-endowed with high-skilled labour and Internet density are more inclined to free trade in sectors which use these factors intensively, countries with good contracting institutions appear to have the opposite behavior of holding on to high services restrictions in sectors that are precisely intense in these institutions. In other words, factor type of comparative advantage explains positively lower trade barriers whereas institutional comparative advantage appears to give explanation to holding on to protectionist measures. This is at least surprising since one would expect that countries with a stronger rule of law also have a strong comparative

advantage in sectors which are institutional intense, and therefore are more inclined to liberalize these domestic services.

Which sectors are then institutional intense? Tables 8 and 9 list for both complexity and Herfindahl variable respectively the index values. As for complexity, Table 8 shows that services such as Professional services and Financial services are most complex as opposed to the Retail sector or Transportation which show a low value indicator. According to the regression results for Mode 1 this implies that both Professional and Financial services (and to a lesser degree Telecom and Insurance) are sectors which are less likely to be liberalized in countries with good domestic institutions. Looking at Figure 1 it shows the STRI index of services barriers for different country groups regarding Mode 1. On the whole Financial services together with Insurance services is still largely protected in all country groups whereas Professional services much less. On the other hand, however, Professional services still remain relatively well protected in OECD economies. These countries are usually economies which in particular show well-developed domestic legal institutions.

In similar manner, in Table 9 Professional services and Transportation, and to some extent Finance and Telecom, are shown to be most vulnreble to hold-up problems in the supply chain. Therefore one would expect that countries with high quality of rule of law are better placed to develop comparative advantage in these sectors and will find it easier to liberalize. Yet, regression results in Table 6 show that precisely these countries, which are better placed to combat hold-up problems are reluctant to open up their domestic services markets in these sectors. Figure 2 confirms this conclusion by showing that OECD countries still have high services barriers when it comes to Mode 3 for Professional services and Transportation. Even for most other country groups Professional services and Transport appear to be sectors which are harder to liberalize in Mode 3.

It is striking to note that one the whole comparative advantage in factors have a reversed affect on unilateral liberalization than institutions. Governments seem to recognize that once a strong domestic base in factor endowments has been developed it's much easier to decrease services barriers in some sectors. The question is why this is not the case for institutions. Economically the efficiency forces for factors should play an equally important role in prospective gains of liberalizing institutionally dependent sectors in countries with strong domestic institutions. It therefore seems appropriate to think of any political economy explanation for why these countries are holding back any openings in market access. One potential explanation is the way these protected sectors are organized. Professional services for Mode 1 largely covers free professions such as accountancy and architecture which involves large fixed training costs measured by complexity. Often these professions involves small firms and due to their size protective rents accruing to these firms are therefore relatively big. The fact that no negative effect is found for Mode 3 might have to do with the issue that bigger firms are active on this market and, hence, protective rents are rather small relative to their size. On the other hand, for Mode 3 hold-up problems appear a strong explanator for lower liberalization efforts in countries

with strong rule of law. Part of the reason could be that this mode covers investments in global supply chains. Global supply chains are in essence sensitive to any hold-up problem due to the slicing up of the production process over a large geographical scale, which includes many contracts between parties.

More reasearch is needed to explore these political economy forces of why institutional factors specifically related to contracts are a strong source for countries to hold back liberalization efforts in services.

5 Conclusion

This paper has investigated whether comparative advantage forces in services as part of domestic interest approaches in political economy can explain lower trade barriers undertaken by countries on a unilateral basis. The results of the paper show that comparative advantage as defined in this paper as the interaction between country features and sector intensities are a robust explanator of why countries do liberalize outside the multilateral framework. However, not all comparative advantage forces explain autonomous liberalization in the same way. A greater high-skilled labour supply appear to be a precondition for countries to liberalize services which use this type of labour intensely. This requirement, however, does not seem to hold for institutionally intense services in countries with strong domestic institutions.

The results have implications for negotiating services within the multilateral context, i.e. at the WTO. First, the comparative advantage sources of unilateral liberalization are not consistent across Modes. Although high-skilled labour does play a role for Mode 3, this does not seem to be the case for Mode 1. Similarly, complex sectors with high fixed training costs are more important for Mode 1 whereas input-sensitive sectors have more meaning for Mode 3. Since these results have importance that vary by type of country and mode it suggests that there is room for negotiationg one sector against another for developing countries versus developed countries. For instance, an institutional complex sector for Mode 3 such as Transportation has high barriers in developed countries, but these restrictions are less high for some less-developed countries. On the other hand, richer countries will find it easier to liberalize Financial services whereas poorer countries are more reluctant to do so. Yet, these sector across modes could be traded against each other, the more so since less-developed countries have increased their competitiveness in exporting Transportation services. (Saez, *et al.*, 2013) At the same time Transportation services require less high-skilled labour relative to other services. For policy makers it may therefore be useful to play out services sectors against each other across country groups and modes based on endowment supply and sectoral needs. In thi sense it would be good to have a full understanding of which countries possess what factors in relative abundance together with a typology of the intensities for each services sector.

A third approach to services liberalization, namely through PTAs, has not been dealt with in this paper. As part of future research it would be interesting to find out whether

the same comparative advantage forces are as important for discriminatory liberalization as for unilateral tariff reduction. If so the negotiations at the GATS could learn from these dynamics by trying to implement them as described in the above-mentioned exmple.

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Figures and Tables

Table 1: Unilateral liberalization and Comparative Advantage

	(1)	(2)	(3)	(4)
		$\ln(U_o^s)$		
		OLS		
		ALL MODES		
$\ln(H_o)$*$\ln(h^s)$	3.573***			3.730***
	(0.787)			(0.876)
$\ln(C_o)$*$\ln(c^s)$		-0.187**		-0.034
		(0.091)		(0.108)
$\ln(I_o)$*$\ln(i^s)$			0.004	-0.058
			(0.091)	(0.108)
FE δ_o	Yes	Yes	Yes	Yes
FE γ^s	Yes	Yes	Yes	Yes
Observations	570	534	606	486
R^2	0.587	0.592	0.566	0.603
RMSE	1.031	1.024	1.047	1.010

Robust standard errors clustered by country in parentheses

Dependent variable is ln(1+STRI)*-1

*** p<0.01, ** p<0.05, * p<0.1

Table 2: Unilateral liberalization and Comparative Advantage

	(1)	(2)	(3)	(4)
			$\ln(U_o^s)$	
			OLS	
			MODE 1	
$\ln(H_o)$*$\ln(h^s)$	-0.040			-4.046**
	(1.257)			(1.853)
$\ln(C_o)$*$\ln(c^s)$		-0.091		0.162
		(0.207)		(0.217)
$\ln(I_o)$*$\ln(i^s)$			0.441***	0.988***
			(0.130)	(0.195)
FE δ_o	Yes	Yes	Yes	Yes
FE γ^s	Yes	Yes	Yes	Yes
Observations	380	356	404	324
R^2	0.412	0.440	0.448	0.476
RMSE	1.332	1.276	1.292	1.239

Robust standard errors clustered by country in parentheses

Dependent variable is ln(1+STRI)*-1

*** p<0.01, ** p<0.05, * p<0.1

Table 3: Unilateral liberalization and Comparative Advantage

	(1)	(2)	(3)	(4)
		$\ln(U_o^s)$		
		OLS		
		MODE 3		
$\ln(H_o)$*$\ln(h^s)$	4.945***			5.106***
	(1.056)			(1.192)
$\ln(C_o)$*$\ln(c^s)$		-0.230		0.002
		(0.146)		(0.170)
$\ln(I_o)$*$\ln(i^s)$			0.119	0.048
			(0.107)	(0.124)
FE δ_o	Yes	Yes	Yes	Yes
FE γ^s	Yes	Yes	Yes	Yes
Observations	570	534	606	486
R^2	0.527	0.519	0.500	0.540
RMSE	1.263	1.269	1.289	1.247

Robust standard errors clustered by country in parentheses

Dependent variable is ln(1+STRI)*-1

*** p<0.01, ** p<0.05, * p<0.1

Table 4: Unilateral liberalization and Comparative Advantage

	(1)	(2)	(3)	(4)
		$\ln(U_o^s)$		
		OLS		
		ALL MODES		
$\ln(H_o)$*$\ln(h^s)$	3.786***	3.725***	3.724***	3.729***
	(0.878)	(0.885)	(0.875)	(0.885)
$\ln(C_o)$*$\ln(c^s)$	-0.020	-0.034	-0.035	-0.026
	(0.108)	(0.113)	(0.112)	(0.114)
$\ln(I_o)$*$\ln(i^s)$	-0.047	-0.058	-0.057	-0.032
	(0.110)	(0.106)	(0.107)	(0.111)
$RULAW_o$*$herf^s$	-0.840*			-0.949*
	(0.474)			(0.480)
$\ln(H_o)$*$compl^s$		0.015		0.005
		(0.575)		(0.658)
$RULAW_o$*$compl^s$			0.015	0.159
			(0.234)	(0.273)
FE δ_o	Yes	Yes	Yes	Yes
FE γ^s	Yes	Yes	Yes	Yes
Observations	486	486	486	486
R^2	0.606	0.603	0.603	0.606
RMSE	1.009	1.011	1.011	1.011

Robust standard errors clustered by country in parentheses

Dependent variable is ln(1+STRI)*-1

*** p<0.01, ** p<0.05, * p<0.1

Table 5: Unilateral liberalization and Comparative Advantage

	(1)	(2)	(3)	(4)
		$\ln(U_o^s)$		
		OLS		
		MODE 1		
$\ln(H_o)$*$\ln(h^s)$	-4.167**	-3.725*	-1.802	-1.676
	(1.912)	(1.915)	(1.645)	(1.715)
$\ln(C_o)$*$\ln(c^s)$	0.179	0.231	0.322	0.293
	(0.218)	(0.226)	(0.223)	(0.233)
$\ln(I_o)$*$\ln(i^s)$	1.011***	0.930***	0.629***	0.609***
	(0.212)	(0.199)	(0.153)	(0.188)
$RULAW_o$*$herf^s$	-0.491			0.351
	(0.645)			(0.677)
$\ln(H_o)$*$compl^s$		-1.276		0.568
		(1.375)		(1.613)
$RULAW_o$*$compl^s$			-1.901***	-2.056***
			(0.534)	(0.605)
FE δ_o	Yes	Yes	Yes	Yes
FE γ^s	Yes	Yes	Yes	Yes
Observations	324	324	324	324
R^2	0.477	0.481	0.528	0.529
RMSE	1.240	1.235	1.178	1.182

Robust standard errors clustered by country in parentheses

Dependent variable is ln(1+STRI)*-1

*** p<0.01, ** p<0.05, * p<0.1

Table 6: Unilateral liberalization and Comparative Advantage

	(1)	(2)	(3)	(4)
		$\ln(U_o^s)$		
		OLS		
		MODE 3		
$\ln(H_o)$*$\ln(h^s)$	5.266***	4.962***	5.084***	4.983***
	(1.195)	(1.323)	(1.211)	(1.323)
$\ln(C_o)$*$\ln(c^s)$	0.041	-0.014	-0.000	0.012
	(0.169)	(0.175)	(0.175)	(0.175)
$\ln(I_o)$*$\ln(i^s)$	0.080	0.063	0.053	0.130
	(0.128)	(0.124)	(0.122)	(0.131)
$RULAW_o$*$herf^s$	-2.362***			-2.681***
	(0.745)			(0.760)
$\ln(H_o)$*$compl^s$		0.508		0.593
		(0.965)		(1.080)
$RULAW_o$*$compl^s$			0.057	0.340
			(0.307)	(0.331)
FE δ_o	Yes	Yes	Yes	Yes
FE γ^s	Yes	Yes	Yes	Yes
Observations	486	486	486	486
R^2	0.554	0.540	0.540	0.556
RMSE	1.229	1.247	1.248	1.229

Robust standard errors clustered by country in parentheses

Dependent variable is ln(1+STRI)*-1

*** p<0.01, ** p<0.05, * p<0.1

Table 7: Unilateral liberalization and Comparative Advantage

	(1)	(2)	(3)
		$\ln(U_o^s)$	
		Probit	
	All MODES	MODE 1	MODE 3
$\ln(H_o)$*$\ln(h^s)$	0.251	-1.265	0.528
	(0.502)	(1.036)	(0.546)
$\ln(C_o)$*$\ln(c^s)$	-0.039	0.107	0.053
	(0.071)	(0.115)	(0.086)
$\ln(I_o)$*$\ln(i^s)$	0.014	0.341*	0.055
	(0.088)	(0.178)	(0.092)
$RULAW_o$*$herf^s$	-0.474	1.288	-1.077**
	(0.572)	(1.002)	(0.544)
$\ln(H_o)$*$compl^s$	0.093	-0.542	-0.008
	(0.290)	(0.598)	(0.326)
$RULAW_o$*$compl^s$	-0.203	-1.088**	-0.106
	(0.221)	(0.534)	(0.244)
FE δ_o	Yes	Yes	Yes
FE γ^s	Yes	Yes	Yes
Observations	288	220	264
R^2	0.344	0.403	0.310
LogLik	-111.7	-90.0	-110.6

Robust standard errors clustered by country

Dependent variable is Pr=1 for liberalization when (STRI<50)

*** p<0.01, ** p<0.05, * p<0.1

Table 8: Complexity of sectors

Sector	Complexity
Professional services	0.859
Financial services	0.568
Telecommunications	0.519
Insurance services	0.451
Transportation	0.326
Retail services	0.308

Table 9: Herfindahl input use

Sector	Herfindahl
Transportation	0.958
Professional services	0.928
Financial services	0.885
Telecommunications	0.857
Retail services	0.799
Insurance services	0.704

Figure 1: Mode 1 Services Restrictiveness.

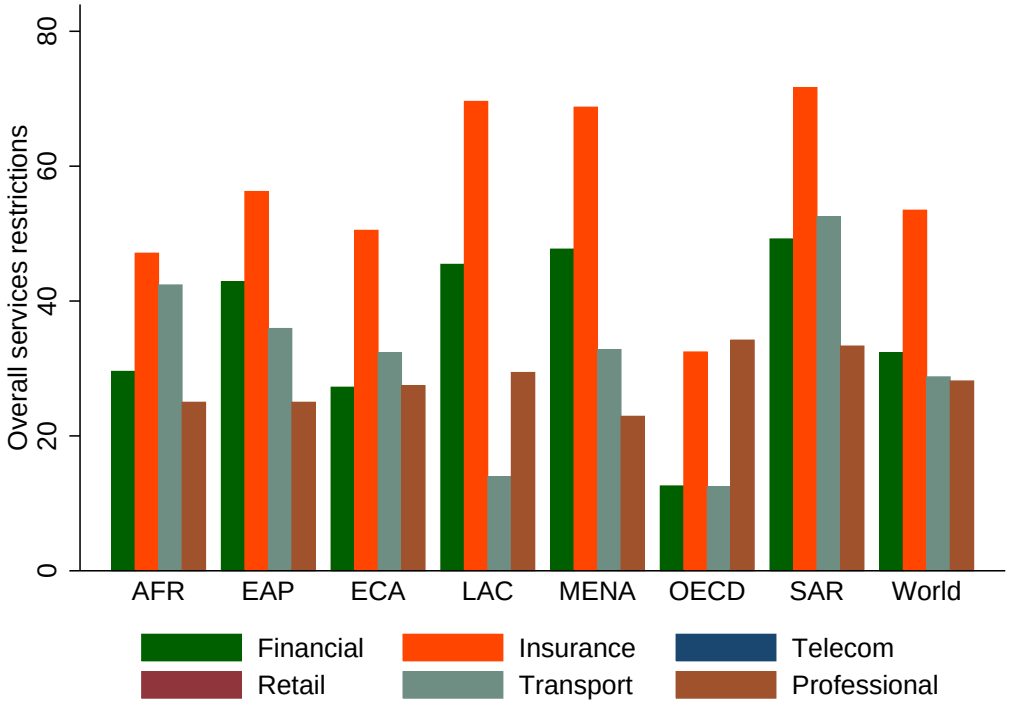

Figure 2: Mode 3 Services Restrictiveness.